

SPECIFICATION

COMPUTER ENCLOSURE WITH LOCKING BAR

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to computer enclosures, and more particularly to enclosures which have a side panel and a top panel that can be independently and readily secured to the enclosure by a locking bar.

2. Description of Related Art

[0002] A typical contemporary personal computer enclosure accommodates a number of electronic devices therein. The enclosure needs to be opened on a number of occasions for a variety of reasons, such as for replacing a defective electronic device with a new one. Therefore, the enclosure should be able to be readily opened and subsequently reassembled.

[0003] A conventional computer enclosure comprises a base, side panels, and a top panel. The side panels and the top panel are respectively secured to the base of the enclosure with separate securing elements. A plurality of locking slots is defined in the base. A plurality of locking tabs is formed on the side panels and the top panel, for engagement into the locking slots of the base. Screws are then used to secure the side panels and the top panel to the base.

[0004] A tool is required for installation and removal of the screws. This is unduly inconvenient and time-consuming. Examples of the abovementioned mechanisms are disclosed in Taiwan Patent Applications Nos. 85211135 and 86213035, and U.S. Patent No. 5,600,540.

[0005] An improved computer enclosure is desired to overcome the above-described disadvantages of the related art.

SUMMARY OF THE INVENTION

[0006] Accordingly, an object of the present invention is to provide a computer enclosure which has a locking bar for readily securing a side panel and a top panel to the enclosure such that the side and top panels can be independently detached from the enclosure.

[0007] Another object of the present invention is to provide a computer enclosure which can be protected from being opened by unauthorized persons.

[0008] In order to achieve the objects set out above, a computer enclosure of the present invention comprises a base, a side panel, a top panel and a locking bar. The base of the enclosure comprises a rear plate forming a horizontal flange at a top edge thereof and a bent flange at a side edge thereof. A plurality of fixing tabs is formed on the bent flange and on the rear plate near the bent flange. The fixing tabs define a receiving space therebetween. An opening and a plurality of first locking slots are defined in the rear plate at the receiving space. An exposed portion of the rear plate is located above the receiving space. The locking bar is received into the receiving space, and can vertically move therewithin. A plurality of second locking slots is defined in the locking bar, corresponding to the first locking slots of the rear plate. An arm portion is formed at a top of the locking bar. A central blocking section projects upwardly from the arm portion. An operating tab extends from the locking bar and is received in the opening of the rear plate. The side panel forms a plurality of bent tabs received in the first and second locking slots. A catch is formed on the top panel, corresponding to the exposed portion of the rear plate. The blocking section of the locking bar blocks the catch. An operating block is

engaged with the operating tab for facilitating operation of the locking bar. The locking bar and the operating block can be locked to a locking tab bent rearwardly from the rear panel, to protect the enclosure from being opened by unauthorized persons.

[0009] Other objects, advantages and novel features of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is an exploded view of a computer enclosure in accordance with the present invention;

[0011] FIG. 2 is a perspective view of a base of the computer enclosure of FIG. 1;

[0012] FIG. 3 is a perspective view of a locking bar of the computer enclosure of FIG. 1;

[0013] FIG. 4 is a perspective view of the base, the locking bar, a disk drive bracket and a side panel of the computer enclosure of FIG. 1 assembled together, with part of the disk drive bracket cut away for clarity;

[0014] FIG. 5 is an assembled view of FIG. 1, with part of a top panel of the computer enclosure cut away for clarity; and

[0015] FIG. 6 is an assembled view of FIG. 1, but viewed from a rear of the computer enclosure.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Reference will now be made to the drawing figures to describe the present invention in detail.

[0017] Referring to FIG. 1, a computer enclosure of the present invention comprises a base 10, a disk drive bracket 20, a locking bar 50, a side panel 80 and a top panel 90. FIG. 1 shows the top panel 90 in an inverted position. The locking bar 50 cooperates with a spring 100 to secure the side and top panels 80, 90 to the base 10.

[0018] Referring to FIG. 2, the base 10 of the enclosure comprises a bottom plate 12, a front plate 14, a rear plate 16 and a side plate 18. A plurality of locking grooves 13 is defined in a side edge of the bottom plate 12 that is opposite to the side plate 18. A bent flange 22 extends perpendicularly inwardly from an edge of the rear plate 16 that is opposite to the side plate 18. A retaining tab 29 is inwardly formed on an upper portion of the bent flange 22. A plurality of fixing tabs 24 is inwardly formed on the rear plate 16 near the said edge thereof, and also on the bent flange 22. The fixing tabs 24 of the rear plate 16 are bent toward the fixing tabs 24 of the bent flange 22, and all the fixing tabs 24 thereby cooperatively define a receiving space (not labeled) therebetween. An opening 26 is defined in an upper portion of the rear plate 16 between two uppermost fixing tabs 24 of the rear plate 16. A locking tab 27 (see FIG. 6) is rearwardly bent from the rear plate 16 at one side extremity of the opening 26. A first locking hole 25 (see FIG. 6) is defined in the locking tab 27. A plurality of first locking slots 28 is defined in the rear plate 16, in vertical alignment below the opening 26. A first horizontal flange 30 extends inwardly from a top edge of the rear plate 16. An exposed portion 31 of the rear plate 16 is located

above the receiving space defined by the fixing tabs 24. A pair of spaced cutouts 32 is defined in a free edge of the first horizontal flange 30. A second horizontal flange 34 extends inwardly from a top edge of the side plate 18. A plurality of first apertures 36 is defined in a junction of the second horizontal flange 34 and the side plate 18. The first apertures 36 are L-shaped. A pair of locating holes 21 is defined near opposite sides of a top portion of the front plate 14 respectively.

[0019] The disk drive bracket 20 comprises a sidewall 38. A plurality of locking grooves 44 is defined in a bottom portion of the sidewall 38. The locking grooves 44 of the disk drive bracket 20 are similar to the locking grooves 13 of the bottom plate 12 of the base 10. A bent portion 40 extends horizontally inwardly from a top edge of the sidewall 38. A plurality of second apertures 42 is defined in a junction of the bent portion 40 and the sidewall 38. The second apertures 42 are also L-shaped.

[0020] Referring to FIG. 3, the locking bar 50 is elongated. A plurality of second locking slots 52 is defined in the locking bar 50, corresponding to the first locking slots 28 of the rear panel 16 of the base 10. A top end of the locking bar 50 is bent generally perpendicularly to form an arm portion 54. The arm portion 54 has a central blocking section 56 projecting upwardly from a middle thereof. The blocking section 56 has a vertical side face proximate to where the locking bar 50 is bent generally perpendicularly. Another face of the blocking section 56 slopes down from a top of the vertical side face toward a free end of the arm portion 54. A connecting tab 62 is formed on an upper portion of the locking bar 50, and extends in a direction parallel to a direction in which the arm portion 54 is bent from the locking bar 50. A through hole 64 is defined in the connecting tab 62. An operating tab 66 extends from the locking bar 50 between the arm portion 54 and the connecting tab 62, in a direction

opposite to the direction in which the arm portion 54 is bent from the locking bar 50. A second locking hole 68 is defined in the operating tab 66. Referring also to FIG. 1, an operating block 70 engages with the operating tab 66 for facilitating operation of the locking bar 50. A third locking hole 72 is defined in the operating block 70, corresponding to the first locking hole 25 of the locking tab 27 and the second locking hole 68 of the operating tab 66.

[0021] The side panel 80 of the computer enclosure forms a plurality of hooks 82 at top and bottom peripheral flanges thereof, and a plurality of bent tabs 83 bent inwardly from a rear peripheral flange thereof. The bent tabs 83 correspond to the first locking slots 28 of the rear plate 16 of the base 10. The hooks 82 of the top peripheral flanges correspond to the locking grooves 44 of the sidewall 38 of the disk drive basket 20. The hooks 82 of the bottom peripheral flanges correspond to the locking grooves 13 of the bottom plate 12 of the base 10.

[0022] The top panel 90 of the computer enclosure forms a pair of rims 92 extending perpendicularly from opposite sides thereof respectively. A plurality of nubs 94 is inwardly formed from the rims 92. The nubs 94 correspond respectively to the first apertures 36 of the side plate 18 of the base 10, and to the second apertures 42 of the disk drive bracket 20. A pair of posts 91 extends inwardly from a front portion of the top panel 90, for insertion into the locating holes 21 of the front plate 14 of the base 10. A pair of latches 96 is inwardly formed at a rear end of the top panel 90, corresponding to the cutouts 32 of the rear plate 16. A catch 98 is inwardly formed at a rear corner of the top panel 90, corresponding to the exposed portion 31 of the rear plate 16.

[0023] Referring to FIGS. 1-6, in assembly, the locking bar 50 is inserted into the receiving space (not labeled). One end of the spring 100 is clasped to the retaining tab 29 of the rear plate 16 of the base 10. The other end of the spring

100 is clasped into the through hole 64 of the connecting tab 62 of the locking bar 50. The locking bar 50 is thereby connected to the base 10. The operating tab 66 of the locking bar 50 extends through the opening 26 of the rear plate 16. The operating block 70 is then attached to the operating tab 66, with the second and third locking holes 68, 72 being aligned with each other. The locking bar 50 can vertically move in the receiving space, with the operating tab 66 moving within the opening 26. When the spring 100 is in a normal state, the second locking slots 52 of the locking bar 50 are substantially higher than the corresponding first locking slots 28 of the rear plate 16. The disk drive bracket 20 is then placed into the base 10, such that it spans between the front and rear plates 14, 16 of the base 10. The sidewall 38 of the disk drive bracket 20 is parallel to but opposite from the side plate 18 of the base 10.

[0024] In attachment of the side panel 80 to the base 10, the hooks 82 of the side panel 80 are respectively loosely received in the locking grooves 13 of the bottom plate 12 of the base 10, and in the locking grooves 44 of the sidewall 38 of the disk drive bracket 20. At that time, the bent tabs 83 of the side panel 80 are aligned with the first locking slots 28 of the rear plate 16. The side panel 80 is manually pushed forwardly. The hooks 82 are pressingly received in the locking grooves 13 of the base 10 and in the locking grooves 44 of the disk drive bracket 20. The bent tabs 83 of the side panel 80 pass through the first locking slots 28 and force the second locking slots 52 downward. This causes the locking bar 50 to move downwardly, and the spring 100 to stretch. The bent tabs 83 of the side panel 80 are therefore extended through the second locking slots 52. The spring 100 returns to its original position, pulling the locking bar 50 back up to its original position. The bent tabs 83 are prevented from exiting the first and second locking slots 28, 52. Thus, the side panel 80 is secured to the base 10.

[0025] To attach the top panel 90 to the base 10, the posts 91 of the top panel 90 are aligned with the locating holes 21 of the front plate 14. The nubs 94 of the top panel 90 are loosely received in front portions of the first apertures 36 of the side plate 18 and second apertures 42 of the disk drive bracket 20. The top panel 90 is manually pushed rearwardly, to cause the latches 96 of the top panel 90 to lockingly engage in the cutouts 32 of the rear plate 16. The posts 91 of the top panel 90 are inserted into the locating holes 21 of the front plate 14. The nubs 94 of the top panel 90 are interferentially received in rear portions of the first and second apertures 36, 42. The blocking section 56 of the locking bar 50 is depressed by the catch 98 of the top panel 90. The locking bar 50 is thus moved downwardly, and the spring 100 is stretched. The catch 98 passes over the sloped face of the blocking section 56 and beyond the vertical face of the blocking section 56. The spring 100 then returns to its original position, pulling the locking bar 50 back up to its original position. The catch 98 is thus blocked from moving forwardly by the vertical face of the blocking section 56. Thus, the top panel 90 is secured to the base 10.

[0026] In the above description, the side panel 80 is secured to the base 10 prior to the top panel 90 being secured to the base 10. It will be readily appreciated that the side panel 80 and the top panel 90 can be independently secured to the base 10. Accordingly, the top panel 90 can be secured to the base 10 prior to the side panel 80 being secured to the base 10.

[0027] In detachment of the side panel 80, the operating block 70 is pushed downwardly. The side panel 80 is pushed rearwardly, so that the bent tabs 83 of the side panel 80 exit the first and second locking slots 28, 52. The side panel 80 is then easily removed from the base 10.

[0028] In detachment of the top panel 90, the operating block 70 is pushed downwardly. The top panel 90 is pushed forwardly, and the catch 98 is freed

from the blocking section 56 of the locking bar 50. The top panel 90 is then easily removed from the base 10.

[0029] FIG. 6 shows the side and top panels 80, 90 are secured to the base 10. The second and third locking holes 68, 72 respectively of the operating tab 66 and operating block 70 are aligned with the first locking hole 25 of the locking tab 27. The operating tab 66 and the operating block 70 can then be locked to the locking tab 27 by using a conventional locking device such as a padlock. The operating block 70 is thereby fixed to the rear plate 16 of the base 10, and cannot be moved. This protects the enclosure from being opened by unauthorized persons.

[0030] It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.